

Information on the Study:

German Environmental Survey for Children and Adolescents GerES 2014-2017

Why is a German environmental health study of children and adolescents carried out?

As Germany's central environmental authority, the Federal Environment Agency (Umweltbundesamt, UBA) is committed to ensuring a healthy environment in which people are protected against harmful environmental influences. That is why it regularly conducts large-scale environmental studies to determine what potentially harmful substances and environmental factors people in Germany come into contact with. The German Environmental Survey for Children and Adolescents (GerES V) generates current information on environmental impacts on children and adolescents throughout Germany and investigates young people's exposure to chemical and physical stressors at home and in their residential environment. The study contributes to the identification of environmental factors that are harmful to health and the initiation of abatement and preventive measures to protect and promote the health of the young generation.

Who carries out the study and who has commissioned it?

The study is carried out by the Federal Environment Agency in close cooperation with the Robert Koch Institute's German Health Interview and Examination Survey for Children and Adolescents (KiGGS, Wave 2).

The study is funded by the Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety as well as by the Federal Ministry of Education and Research.

Who is being studied?

The German Environmental Survey for Children and Adolescents, GerES 2014-2017, is a nationwide cross-sectional study. The participants are 2,500 children and adolescents 3 to 17 years of age from 167 study locations in Germany. All participating children and adolescents have already taken part in the Robert Koch Institute's KiGGS Wave 2 study and have been chosen so as to be representative of the German population in that age group.

When is the study carried out?

The study started in 2014, and data collection will end in 2017.

What is being studied?

One main element of the study programme is human biomonitoring (HBM), i.e. the analysis of body material. Samples are being taken of the participating children and adolescents' blood and urine and analysed for a large number of environmental pollutants. In addition, the pollution which the participants are exposed to in their residential environment will be determined. This comprises the analysis of drinking water, house dust and indoor air as well as sound level measurements.

In particular, samples are collected and measurements performed to determine the following substances and adverse environmental influences:

- Endocrine disruptors (hormonally active substances) with potential long-term effects on metabolism, fertility and neuronal development, such as flame retardants, phthalates and other plasticisers, and their substitutes, substances contained in cosmetics such as bisphenol A, parabens, triclosan, and organic solvents such as pyrrolidones.
- Substances which can damage the nervous system, such as polychlorinated biphenyls (PCBs), mercury and pesticides belonging to the group of chlorinated cyclic hydrocarbons.
- Air pollutants such as fine and ultrafine particulate matter, benzothiazoles, naphthalene, toluene, formaldehyde and other volatile organic compounds.
- Potential carcinogens and cancer promoters, such as lead, arsenic, polycyclic aromatic hydrocarbons (PAHs) and volatile organic compounds like benzene and formaldehyde.
- Not readily degradable substances that remain in the body for long periods of time, such as polyfluorinated compounds, cadmium and lead.
- Environmental stressors such as traffic noise.

In addition, standardized interviews of the participants and their parents are conducted to determine key factors influencing the extent of individual exposure to pollutants, such as the residential environment, furnishings, eating habits, use of products, and environmentally relevant modes of behaviour.

Parts of the collected blood and urine samples are put in frozen storage, if consent has been given. These subsamples will be analysed at a later time for new pollutants for which analytical methods are still under development.

What are the collected data used for?

- The study generates population-based data on the exposure of children and adolescents in Germany to environmental contaminants.
- These up-to-date data are used to derive reference values describing the extent of the exposure of children and adolescents to environmental contaminants. These values form the basis for uniform evaluation throughout Germany and can also be used as European standard in EU-wide studies.
- The study data are a prerequisite for providing early warning of health effects.
- The data serve to identify trends and trend shifts. They can also be used for analyzing common and possible interventions.
- The data make it possible to identify groups subject to specific exposures and shed light on exposure sources and pathways.

- In addition, the data are used to determine environmentally induced burdens of disease and examine possible links between socioeconomic factors and exposure to environmental stress with regard to environmental justice.

How are the participating families involved in the study programme?

The Federal Environment Agency has commissioned Kantar Health GmbH to conduct the interviews and do the sampling and measurements in the homes of the participating families.

During these home visits, field staff:

- receive tap water samples collected from the families' homes,
- receive a morning-void urine sample collected from the child or adolescent,
- carry out the sound level measurement,
- measure the level of ultrafine particulate matter in indoor air,
- interview the parents or guardians and adolescents over the age of 11, asking about possible exposure sources in the home
- and ask questions about the child or adolescent's health.

In some randomly selected households, the study programme additionally includes:

- analysis of dust from a full vacuum cleaner bag,
- determination of volatile organic compounds in indoor air over 7 days using small suspendable samplers, or
- collection of particulate matter from indoor and outdoor air over 7 days using stand-up collection devices.

How are personal data secured?

The data generated in the study are stored and evaluated without reference to name and address. The Federal Commissioner for Data Protection has been informed about the study and has approved the project from the data protection point of view.

Participation in the study or individual study components is voluntary. All participants are advised that there will not be any negative consequences if they do not participate.

Who guarantees the quality of the study?

The study follows the guidelines on "Good Epidemiological Practice" by the German Society for Epidemiology (DGEpi).

Throughout the performance and evaluation of the study, the Federal Environment Agency is advised by an external scientific committee.

The Ethics Commission of the Berlin Chamber of Physicians has assessed the study in regard to ethical concerns and has agreed to its performance.

What happens to the results?

On request, participants are notified of their results after about four to six months, and along with this are given an environmental health evaluation of the levels detected in human biomonitoring and in the samples from their homes. In the case of abnormal test results, participants are advised to get medical advice, for example at an environmental health outpatient unit.

The study's results are expected to be published one and a half years after its completion. They will be presented in a way specific to each target group, i.e. the public (print media, radio, TV, internet), the public health service, environmental health specialists, policymakers and the

scientific community (peer-reviewed journals). The data from the study will also be made available to environmental health researchers, epidemiologists and specialists in other disciplines.

What environmental policy measures have the results of the German Environmental Health Studies helped to initiate in the past?

The Federal Environment Agency has been doing nationwide environmental surveys for 30 years now. Below is a selection of important results:

- The German Environmental Survey for Children 2003-2006, GerES IV, produced evidence for the first time that mould in the home increases the risk of allergy in children.
- In addition, based on data from GerES IV, the reproduction-toxic plasticiser DEHP (di(2-ethylhexyl)phthalate) may no longer be used in childcare articles and toys in Europe since 2007.
- These GerES data were also used to analyse the social distribution of exposure to environmental stresses. The analysis shows that socially disadvantaged groups of the population are more often and more severely affected by environmental problems.
- Based on data from the studies, the Federal Institute for Risk Assessment no longer recommends the use of dental amalgam for children. Internationally, the data were also taken into account by the World Health Organisation (WHO) in its assessment.
- The first German Environmental Survey 1985-1986, GerES I, showed that tap water often contained heavy metals, such as lead or copper, which came from domestic water pipes. This was one of the reasons that, in 1990, the scope of the German Drinking Water Ordinance was extended to include water quality at the tap.

Where can you get more information?

A website with detailed information, contact data, and descriptions and results of previous studies has been set up. The GerES team can also be reached by phone:

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